CLAIMS

What is claimed is:

1. A population of small and rapidly self-renewing stem (RS) cells, wherein the cells within said population express one or more polypeptides selected from the group consisting of VEGF receptor-2 (FLK-1), TRK (an NGF receptor), transferrin receptor, and annexin II (lipocortin 2).

2. The population of cells of claim 1, further wherein the cells within said population express one or more polypeptides selected from the group consisting of multidrug resistance protein, epithelial membrane antigen, CD4, CD104, CD117, heat shock protein-27, tumor rejection antigen, glutathione-S transferase, peroxiredoxin 1, voltage-dependent-anion channel-2, protein kinase C substrate, phosphatase 2A inhibitor, esterase D, RNase A, initiation factor 5a, elongation factor 1-alpha, ribosomal protein S12, ribosomal protein large P1, ribosomal protein large P2, transcription factor BTF 3a, annexin I, destrin, myosin light chain, lactate dehydrogenase A, glycerolaldehyde-3-P dehydrogenase, citrate synthetase, transketolase, P-glycerolmutase, aldo-keto reductase 7(A2), alpha-amylase inhibitor CM3, enoyl-CoA hydratase, and proteosome subunit alpha-4.

3. The population of cells of claim 1, wherein the cells within said population express at least twenty-nine polypeptides which are not expressed in a population of large, more mature marrow stromal cells (mMSC).

4. A population of large, more mature marrow stromal cells (mMSC), wherein the cells within said population express one or more polypeptides selected from the group consisting of STRO-1, PDGF receptor, EGF receptor, CD10, and CD147.

5. The population of cells of claim 4, further wherein the cells in said population express one or more polypeptides selected from the group consisting of stress protein T-complex protein 1-alpha, initiation factor 2G, ribosomal large P0, annexin V, actin β chain, lactate dehydrogenase B, phosphoglycerate kinase-1, enolase-1, and protein disulfide isomerase ER60 precursor.

6. The population of cells of claim 5, further wherein the cells in said population express at least nine polypeptides which are not expressed in the population of small rapidly renewing stem (RS) cells.

7. A method of distinguishing a population of small and rapidly self-renewing stem cells (RS) from a population of large, more mature marrow stromal cells (mMSC), said method comprising assessing whether at least about twenty-nine polypeptides are expressed in cells in said RS cell population but are not expressed in said mMSC population, and further wherein at least about nine polypeptides are expressed in said population of MSC, but are not expressed in said population of RS cells, wherein the cells within said RS cell population express one or more polypeptides selected from the group consisting of VEGF receptor-2 (FLK-1), TRK (an NGF receptor), transferrin receptor, and annexin II (lipocortin 2) and said RS cells are about seven micorns in diameter, and wherein the cells within said MSC cell population express one or more polypeptides selected from the group consisting of STRO-1, PDGF receptor, EGF receptor, CD10, and CD147 and are about fifteen to about fifty microns in diameter, thereby distinguishing said populations of cells.

8. The method of claim 7, wherein none of said cells express any of the polypeptides selected from the group consisting of CD1a, CD11B (Mac-1), CD14, CD27, CD34, CD43, CD45, CD133, CD50 (I-CAM 3), CD53, CD109, CD114 (G-CSFR), HLA-2, CCR5 (chemokine receptor-5) and human L1 (neurite adhesion molecule).

9. A population of small and rapidly self-renewing stem cells identified by the method of claim 8.

10. A population of large, more mature marrow stromal cells identified by the method of claim 8.